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Plasma Distributions and Anisotropies at Rotational Discontinuities in the Solar Wind From Ulysses Observations

Ulysses plasma and magnetic field data are used to investigate the properties of rotational discontinuities (RDs) in the solar wind, specifically, the jump conditions across the RDS, speed of propagation, and the plasma distribution function on either side of the RDs. Previous workers have found that Alfvén waves in the solar wind appear to propagate at anomalously slow velocity (e.g., Goldstein et al., Geophys. Res. Letts., **22, 3389, 1995).** *Their* conclusions are based on comparison of the ratio between velocity and magnetic field fluctuations for periods that are Alfvénic with the estimated Alfvén propagation speed adjusted for plasma pressure anisotropy. However, statistical studies of wave properties might give misleading results because of the presence of solar wind turbulence. In the present study we shall present results on the propagation speed determined from jump conditions at clearly identifiable rotational discontinuities. Additionally, rotational discontinuities may, in principle, scatter particles crossing the discontinuity. We shall investigate the plasma pressure anisotropy change across the discontinuities, determine to what extent it is consistent with the double adiabatic hypothesis, and also present detailed distribution functions upstream and downstream of the RDS.